Optical Manipulation Conference'14

OMC'14

Tuesday, April 22

15:30-16:00 Opening Room 313+314

Opening Remarks

15:30 **T. Omatsu, Conference Chair of OMC' 14**
Chiba Univ., Japan

16:00-18:00 BISC& OMC Joint session

Room 313+314

Chair: K. Sasaki, Co-Chair of OMC'14
Hokkaido Univ., Japan

BISC&OMC-1 16:00 **(Plenary) New perspectives for optical manipulation in air and vacuum**
K. Dholakia
Univ. St. Andrews, UK

BISC&OMC-2 16:40 **(Plenary) Polarization-sensitive OCT (PS-OCT) for retinal imaging**
B. Cense
Utsunomiya Univ., Japan

BISC&OMC-3 17:20 **(Plenary) Optical Tweezers Based Biomicrorheology (APLS'14)**
A. Chiou
National Yang-Ming Univ., Taiwan

Wednesday, April 23

9:00-10:25 OMC1: Optical Manipulation1

Room 414+415

Chair: H. Ishihara
Osaka Prefecture Univ., Japan

OMC1-1 9:00 **Optical manipulation of molecular dynamics in neurons**
C. Hosokawa [1)], N. Takeda [1,2)], S. N. Kudoh [2)], T. Taguchi [3)]
[1)] AIST, Japan, [2)] Kwansei Gakuin Univ., Japan, [3)] NICT, Japan

OMC1-2 9:15 **Optical manipulation of quantum dots in superfluid He**
Y. Minowa, H. Tahara, and M. Ashida
Osaka Univ., Japan

OMC1-3 9:30 **Dispersion reduction in generation of high-order optical vortex using axially-symmetric half-wave plates**
M. Sakamoto [1)], R. Fukumoto [1)], K. Oka [2)], R. Morita [2,3)], and N. Murakami [2)]
[1)] Graduate School of Engineering, Hokkaido Univ., Japan, [2)] Faculty of Engineering, , Hokkaido Univ., Japan, [3)] JST CREST, Japan

OMC1-4 9:45 **(Plenary) Laser Trapping Assembling of Clusters and Nanoparticles**
H. Masuhara [1)], T. Sugiyama [1)], K. Yuyama [1)], A. Usman [2)], W. Chiang [1)],
[1)] National Chiao Tung Univ., Taiwan, [2)] King Abdullah Univ. of Science and Engineering, Saudi Arabia

----- Break (10:25-10:45) -----

10:45-12:30 OMC2: Optical Manipulation2

Room 414+415

Chair: Y. Tsuboi
Osaka City Univ., Japan

OMC 2-1 10:45 **Laser-induced breakdown of optically trapped nanoparticlesfor cell transfection**
Y. Arita [1)], M. Ploschner [1)], M. Antkowiak [1,2)], F. G.Moore [2)] and K. Dholakia [1)]
[1)] SUPA, Univ. St. Andrews, UK, [2)] SULSA, Univ. St. Andrews, UK

OMC2-2 11:00 **Optical manipulation with coherent transient phenomena**
T. Kudo, H. Ishihara
Osaka Prefecture Univ., Japan

OMC2-3 11:15 **Dynamics of microparticles trapped in a perfect vortex beam**
M. Chen [1)], M. Maziluand [1)], Y. Arita [1)], E. M. Wright [1,2)], and K. Dholakia [1,2)]
[1)] SUPA, Univ. St. Andrews, UK, [2)] The Univ. of Arizona, USA

OMC2-4 11:30 **Theory for Bio-inspired Optical Manipulation under Fluctuations**
T. Iida [1,2)], M. Tamura [1,3)], S. Hidaka [1,3)], H. Hattori [1,3)], T. Hamada [1,3)], K. Nishida [1,3)], S. Tokonami [1)], T. Itoh [4)], H. Yamauchi [5,6)], H. Miyasaka, and S. Ito [2,5,6)]
[1)] Nanoscience and Nanotechnology Research Center, Research Organization for the 21st Century,Osaka Prefecture Univ, Japan, [2)] JST PRESTO, Japan, [3)]Graduate School of Engineering, Osaka Prefecture Univ., Japan, [4)] AIST, Japan, [5)] Division of Frontier Materials Science, Graduate School of Engineering Science, Osaka Univ., Japan,[6)] Center for Quantum Materials Science under Extreme Conditions, Osaka Univ., Japan

OMC2-5 11:45 **Low-driving-voltage liquid-crystal lens with elliptically distributed refractive indices**
M. Kawamura [1)], S. Oikawa [1)], and S. Sato [2)]
[1)] Akita Univ., Japan, [2)] LC-Lens Institute, Japan

OMC2-6 12:00 **(Invited)Quantitative measurements of rotation in optical tweezers and applications**
H. R. Dunlop
Univ. of Queensland, Australia

----- Lunch Break& Poster Session (12:30-15:30) -----

13:30-15:30 OMC3: Poster Session Exhibition Hall C

OMCp3-1 **Creation of laser trapping beam with 3D dark spot**
Y. Iketaki [1)], K. Hidaka [2)], A. Hirabayashi [2)], and N. Bokor [3)]
[1)] Olympus Corp., Japan, [2)] Ceratech Japan Co., Ltd., Japan, [3)] Budapest Univ. of Technology and Economics, Hungary

OMCp3-2 **Three-dimensional off-axis trapping with optical vortex**
T. Otsu, T. Ando, Y. Takiguchi, Y. Ohtake, H. Toyoda, H. Itoh
Hamamatsu Photonics K.K., Japan

OMCp3-3 **Simulation study for the output modecleaner in KAGRA**
T. Shimizu [1)], K. Yamanoi [1)], R. Nishi [1)], Y. A. Kumeta [1)], C. Bond [2)], and K. Somiya [1)]
[1)]Tokyo Institute of Technology, Japan, [2)]Univ. of Birmingham, UK

OMCp3-4 **Chiral copper nano-needle formation by optical angular momentum transfer**

Y. Tabata [1)], F. Takahashi [1)], S. Takizawa [1)], K. Miyamoto [1)], R. Morita [2,3)], and T. Omatsu [1,3)]
[1)] Chiba Univ., Japan, [2)] Hokkaido Univ., Japan, [3)] JST CREST, Japan

OMCp3-5 **Water jet generated by horizontally focusing a Q-switched laser beneath a flat free surface with different depths**
Ross C. C. Chen, Y. T. Yu, K. W. Su, and Y. F. Chen
National Chiao Tung Univ., Taiwan

OMCp3-6 **Comparison of polarization properties in broad-area vertical cavity surface emitting lasers with different cavity shapes**
Y. T. Yu, P. H. Tuan, K. W. Su, and Y. F. Chen
National Chiao Tung Univ., Taiwan

OMCp3-7 **Real-time THz-wave sensing via infrared lights detection interacted with evanescent THz waves**
T. Akiba [1)], N. Kaneko [1)], K. Suizu [1)], K. Miyamoto [2)], T. Omatsu [2,3)]
[1)] Chiba Institute of Technology,Japan, [2)] Chiba Univ., Japan, [3)] JST CREST, Japan

OMCp3-8 **Higher-Order Single-Transverse Mode Generation from a Yb:YAG Laser Pumped by a Scanning Beam**
T. Sato, Y. Kozawa and S. Sato
Tohoku Univ., Japan

OMCp3-9 **Generation of vector Bessel-Gaussian beams from a c-cut Nd:$GdVO_4$ laser cavity**
T. Sumi, Y. Kozawa, and S. Sato
Tohoku Univ., Japan

OMCp3-10 **Fast and broadband conversion of light polarization using shortcut to adiabaticity**
C. P. He and S. Y. Tseng
National Cheng Kung Univ., Taiwan

OMCp3-11 **Transfer of transverse spin angular momentum using Airy beams**
K. Y. Kim
Sejong Univ., Korea

OMCp3-12 **Optical Trapping of a Single Submicron-Sized Dielectric Particle with Continuous Wave and Pulsed Lasers**
T. H. Liu [1)], A. Usman [2)], W. Y. Chiang [1)], H. Masuhara [1)]
[1)] National Chiao Tung Univ., Taiwan, [2)] King Abdullah Univ. of Science and Technology, Saudi Arabia

OMCp3-13 **Power scale-up of structured laser beams concentrated on three-dimensional Lissajous parametric surfaces**
J. C. Tung [1)], H. C. Liang [2)] and Y. F. Chen [1)]
[1)] National Chiao Tung Univ., Taiwan, [2)] National Taiwan Ocean Univ., Taiwan

OMCp3-14 **Mid-Infrared (6.5μm) optical vortex laser**
K. Furuki [1)], M. T. Horikawa [1)], Y. Tokizane [1,2)], K. Miyamoto [1)], and T. Omatsu [1,2)]
[1)] Chiba Univ., Japan, [2)] JST CREST, Japan

OMCp3-15 **Quantum control of isotope-selective rovibrational excitation of diatomic molecules in the thermal distribution**
A. Ichihara [1)], L. Matsuoka [2)], Y. Kurosaki [1)], K. Yokoyama [1)]
[1)] Japan Atomic Energy Agency, Japan, [2)] Hiroshima Univ., Japan

OMCp3-16 **Optical Kerr response of nano-scale thin films**
T. Kinoshita, H. Ishihara
Osaka Prefecture Univ, Japan

OMCp3-17 **Luminescence Activity of Two-level Molecule with Population Inversion**
R. Hata, N. Yokoshi, H. Ajiki and H. Ishihara
Osaka Prefecture Univ, Japan

OMCp3-18 **Study of crossover between Fano resonance and Rabi splitting in an antenna-molecule coupled system**
N. Murata, Y. Mizumoto, H. Ishihara
Osaka Prefecture Univ, Japan

OMCp3-19 **Theoretical estimation of inter-molecule correlations nearby metallic nanostructures**
Y. Osaka, N. Yokoshi, H. Ishihara
Osaka Prefecture Univ, Japan

OMCp3-20 **In-situ surface-enhanced Raman scattering measurement for plasmon-induced electron transfer reaction at nanogap of Au dimer structure**
K. Suzuki, F. Nagasawa, S. Yasuda and K. Murakoshi
Hokkaido Univ., Japan

OMCp3-21 **Nanoparticle trapping using plasmonic nanostructure and potential analysis**
S. Ishida, T. Wada, Y. Tanaka, and K. Sasaki
Hokkaido Univ., Japan

OMCp3-22 **Angular momentum transfer from photons to plasmons**
K. Sakai, K. Nomura, T. Yamamoto, K. Sasaki
Hokkaido Univ., Japan

OMCp3-23 **Ultra-sensitive observation of molecules under excitation by localized surface plasmons at metal nanogap**
F. Nagasawa, M. Takase and K. Murakoshi
Hokkaido Univ., Japan

OMCp3-24 **Preparation of a two-excitation state in an antenna-coupled double quantum dot**
N. Yokoshi, H. Ishihara
Osaka Prefecture Univ, Japan

OMCp3-25 **Optical Trapping and Ejection of Dielectric Nanoparticles by Double Femtosecond Pulse Trains.**
M. Muramatsu, T. F. Shen, W. Y. Chiang, A. Usman, H. Miyasaka, H. Masuhara
National Chiao Tung Univ., Taiwan

OMCp3-26 **Colloidally-Synthesized Gold Nanoparticle Films Having Tunable Optical Properties**
T. Torimoto [1)], T. Kameyama [1)], Y. Ohno [1)], S. Kuwabata [2)]
[1)] Nagoya Univ., Japan, [2)] Osaka Univ., Japan

15:30-17:45 OMC4: Plasmonc radiation pressure

Room 414+415

Chair: N. M. Litchinitser
State Univ. of New York at Buffalo, USA

OMC4-1 15:30 **(Invited)Optical manipulation of nanostructures by linear and nonlinear resonant responses**
H. Ishihara
Osaka Prefecture Univ., Japan

OMC4-2 16:00 **Selective assembly of microstructures of plasmonic nanorods with radiation**

pressure
S. Ito [1,2,)], H. Yamauchi [1)], M. Tamura [3)], S. Hidaka [3)], H. Hattori [3)], T. Hamada [3)], K. Nishida [3)], S. Tokonami [3)], T. Itoh [4)], H. Miyasaka [1)], and T. Iida [2,3)]
[1)] Osaka Univ., Japan, [2)] JST PRESTO, Japan, [3)] Osaka Prefecture Univ., Japan, [4)] AIST, Japan

OMC4-3 16:15 **Generation of electric-fields enhancements between metal cubes by focused radially polarized beams**
K. Kitamura, T. T. Xu,and S. Noda
Kyoto Univ., Japan

OMC4-4 16:30 **(Invited)Scattering asymmetry and non-conservative Optical Forces on small particles**
J. J. Saenz
Universidad Autonoma de Madrid, Spain

OMC4-5 17:00 **Plasmon-based optical trapping of soft nano-materials: characteristic pattern formation based on radiation force and temperature gradient.**
T. Shoji [1)], Y. Tsuboi [1,2)]
[1)] Osaka City Univ., Japan, [2)] JST PRESTO, Japan

OMC4-6 17:15 **Nanomanipulation using designed plasmonic fields**
K. Sasaki, Y. Tanaka, S. Ishida, K. Sakai, H. Fujiwara
Hokkaido Univ., Japan

OMC4-7 17:30 **Plasmon-induced radiation force with far-infrared light and its application to imaging camera**
K. Ueno, H. Itoh, W. Nakano, S. Nozawa, H. Misawa
Hokkaido Univ., Japan

Thursday, April 24

9:00-10:45 OMC5: Structured light 1

Room 414+415

Chair: S. Ashihara
Tokyo Univ. Agriculture & Technology, Japan

OMC5-1 9:00 **(Invited)Behaviour of optically bound particles in laser beams**
P. Zemánek, O. Brzobohatý, M. Šiler, V. Karásek, L. Chvátal
Academy of Sciences of the Czech Republic, Czech Republic

OMC5-2 9:30 **Generation of broadband terahertz vortex beam**
R. Imai [1)], N. Kanda [1,2,3)], T. Higuchi [1,4)], Z. Zheng [1)], K. Konishi [3)], and M. Kuwata [1,3,4)]
[1)] Dept. of Applied Physics,Univ. of Tokyo, Japan, [2)] RIKEN, [3)] Photon Science Center, Univ. of Tokyo, Japan, [4)] Dept. of Physics, Univ. of Tokyo, Japan

OMC5-3 9:45 **Extended Stokes Parameters Capable of Degree of Polarization definition for Axially-Symmetric Polarization based on Cylindrical Coordinates**
M. Suzuki [1)], K. Yamane [1,2)], K. Oka [1)], Y. Toda [1,2)], R. Morita [1,2)]
[1)] Hokkaido Univ., Japan, [2)] JST CREST, Japan

OMC5-4 10:00 **Generation of quasi-nondiffracting focused beams via secondharmonic process of flower Laguerre-Gaussian modes**
Y. C. Lin, K. W. Su, and Y. F. Chen
National Chiao Tung Univ., Taiwan

OMC5-5 10:15 **Direct generation of a fractional vortex output from an optical parametric oscillator**
A. Abulikemu [1)], T. Yusufu [1)], K. Miyamoto [1)], and T. Omatsu [1,2),]
[1)] Chiba Univ., Japan, [2)] JST CREST, Japan

OMC5-6 10:30 **High-order Hermite-Gaussian modes in self-Raman lasers**
C. Y. Lee, C. C. Chang, C. H. Wu, and Y. F. Chen
National Chiao Tung Univ., Taiwan

----- Break (10:45-11:15) -----

11:15-12:30 OMC6: Structured light 2

Room 414+415

Chair: I. Shoji
Chuo Univ., Japan

OMC6-1 11:15 **Generation of mJ-class ultrashort optical-vortex pulses with programmable topological-charge control**
K. Yamane [1,2)], A. Honda [1)], Y. Toda [1,2)], and R. Morita [1,2)]
[1)] Hokkaido Univ., Japan, [2)] JST CREST, Japan

OMC6-2 11:30 **Mid-IR imaging of the localized plasmonic mode by the scanning near-field optical microscopy**
S. Usui, F. Kusa, K. Kohmura, S. Ashihara
Tokyo Univ. of Agriculture and Technology

OMC6-3 11:45 **Atomic resolution imaging of optical near field using force detection**
Y. Sugawara, S. Yamada, M. Furukawa, T. Tokuyama, J. Yamanishi, Y. Naitoh, and Y. J. Li
Osaka Univ., Japan

OMC6-4 12:00 **(Invited) Generation of temporally and spatially structured laser beams related to Diophantine equations**
Y. F. Chen
National Chiao Tung Univ., Taiwan

----- Lunch Break (12:30-13:30) -----

13:30-14:45 OMC7: Structured matters

Room 414+415

Chair: R. Morita, Programming Chair of OMC'14
Hokkaido Univ., Japan

OMC7-1 13:30 **(Invited)Structured light in linear and nonlinear nanostructures**
N. M. Litchinitser, J. Sun,J. Zeng,X. Wang,M. Shalaev, and A. N. Cartwright
State Univ. of New York at Buffalo, USA

OMC7-2 14:00 **Optical vortex induced chiral surface relief in an azo-polymer film**
G. Juman [1)], M. Watabe [1)], K. Miyamoto [1)], and T. Omatsu [1,2)]
[1)] Chiba Univ., Japan, [2)] JST-CREST, Japan

OMC7-3 **Chiral crystalline silicon nano-cone**

14:15 **formation by the irradiation of an optical vortex pulse**
F. Takahashi [1)], S. Takizawa [1)], K. Miyamoto [1)], H. Hidai [1)], R. Morita [2,3)], and T. Omatsu [1,3)]
[1)] Chiba Univ., Japan, [2)] Hokkaido Univ., Japan, [3)] JST CREST, Japan

OMC7-4 14:30 **Optical fabrication of single-crystalline microspheres with high sphericity**
S. Okamoto, Y. Minowa, and M. Ashida
Osaka Univ., Japan

----- Break （14:45-15:15）-----

15:15-16:45 OMC8: Optical physics Room 414+415

Chair: P. Zemanek
Academy of Sciences of the Czech Republic, Czech Republic

OMC8-1 15:15 **(Invited)Nano-Optical Trapping:Recent developments and applications to quantum physics**
R. Quidant
ICFO-Institut de Ciencies Fotoniques, Spain

OMC8-2 15:45 **Nonlocal theory of peculiar photoluminescence in nano-to-bulk crossover thin films**
T. Matsuda and H. Ishihara
Osaka Prefecture Univ., Japan

OMC8-3 16:00 **A theoretical study of optical microcavity-based laser cooling under different ambient conditions**
N. D. Vy and T. Iida
Osaka Prefecture Univ., Japan

OMC8-4 16:15 **Spatiotemporal decoherence of excitons excited by an optical vortex with multiple orbital angular momentum**
K. Shigematsu [1)], K. Yamane [1,2)], R. Morita [1,2)], and Y. Toda [1,2)]
[1)] Hokkaido Univ., Japan, [2)] JST CREST, Japan

OMC8-5 16:30 **Evaluation of energy flow across an optical beam**
Y. Miyamoto [1)], A. Wada [2)], T. Yonemura [1)], and M. Takeda [3)]
[1)] The Univ. of Electro-Communications, Japan, [2)] National Defense Academy, Japan, [3)] CORE, Utsunomiya Univ., Japan

----- Postdeadline papers (16:45-17:15）-----

17:15-17:30 Closing Room 414+415

Closing Remarks & Best Paper Award
T. Omatsu, Conference Chair of OMC' 14
Chiba Univ., Japan